

Estimation Game

Reporting Category Computation and Estimation

Topic Estimating sums, differences, products, and quotients

Materials

- Sales flyers from local grocery stores
- Calculators

Vocabulary

estimate, estimation, sum, difference, product, quotient

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Use this shopping activity to help the students develop estimation skills. Divide the class into teams of two or three students each, and give each team a copy of a sales flyer from a local grocery store. Tell each team that they have \$50 with which to buy groceries for a week, based on the listed items on sale. They are expected to spend as much of the \$50 as possible, but that is the limit. Give teams 10 minutes to decide on their purchases, write down the items and their prices, and estimate the total cost of all the items without actually adding the prices.
2. Have students share the strategies they used in step 1. Then, give them 15 minutes to repeat the process in step 1, using a budget of \$100. Note whether students who had no strategy for estimation the first time learned from other students who shared their strategies, and whether any students tried a new strategy.
3. Next, ask students to find the actual total costs of their two purchases, using calculators. Have the students compare their two estimates with the actual costs and assess their estimation skills. Discover which team came closest to \$100 in actual expenditures and which team(s) spent more than \$100. Ask whether any team spent exactly \$100.
4. Discuss the estimation strategies that were used, and help students identify the one or ones that were more effective.

Assessment

- **Questions**
 - What estimation strategy or strategies were most effective—i.e., gave the most accurate estimate?
 - Were strategies used that did not give accurate estimates? If so, what were they?
 - What is another combination of items you could purchase for the same amount you estimated in step 2?

- **Journal/Writing Prompts**

- List the prices of your purchases and their estimated total. Then, show your computations by first adding the prices and then subtracting the total from your budgeted amount.

- **Other**

- Have students describe their estimation strategies in writing, and then hold a class discussion on this topic. For example, one estimation strategy is to replace the actual numbers with compatible numbers that are easy to add and subtract mentally (e.g., replace $52 + 74$ with $50 + 75$ so that the estimated (mentally added) sum of 125 is very close to the actual sum of 126).

Extensions and Connections (for all students)

- Have students use estimation skills to plan an end-of-the-year party for the class by gathering prices for party foods and decorations, determining the budget (how much money is available), and estimating the total expenses to find out whether it falls within the budget. Then, have them compute the actual cost and compare their estimate with the actual cost.
- Explain that estimates are used in making budgets for business, industry, and education. However, estimates often fall short of actual costs. Encourage students to discuss the pros and cons of estimation, including the question, "If a budget is based on an estimate and the actual cost proves to be more than the estimate, what might happen?"

Strategies for Differentiation

- Have students use a restaurant menu to order a meal for a family of four by estimating the total cost of all items ordered in order to stay within a given budget.
- Use this lesson as a whole-group activity rather than having students work in small groups.
- Allow students to use calculators.
- Have students use play money as manipulatives.